10th Class 2013

Biology	Group-I	Paper-II
Time: 2.45 Hours	(Subjective Type)	Max. Marks: 63

Part-I

2. Write short answers to any Six (6) questions: 12

(i) What is bronchitis?

Ans It is a respiratory disease in which the inflammation of bronchi or bronchioles occurs. Viruses, bacteria and tobacco smoke, etc. cause it.

(ii) What is brain stem?

Ans The medulla oblongata, pons and midbrain connect the rest of the brain to spinal cord. They are collectively called as brain stem.

(iii) Differentiate between aqueous humour and vitreous chamber.

Ans The cavity of the eye is divided into two chambers *i.e.,* anterior chamber and posterior chamber. The anterior chamber contains a clear fluid known as aqueous humour. While the posterior chamber contains a jelly-like fluid known as vitreous chamber. It helps to maintain the shape of the eye and suspends the delicate lens.

(iv) What is myopia (short sight)?

Ans The elongation of eyeball results in myopia. Such persons cannot see the distant objects clearly. The image of an object is formed in front of retina. This problem can be solved by using concave lens.

(v) What is deafness? How is it caused?

Ans Deafness is a state in which hearing is not possible. The defect of eardrum, cochlea, middle ear ossicles or auditory nerve may cause deafness.

(vi) What is selective re-absorption?

Ans In selective re-absorption, 99% of the glomerule filtrate is reabsorbed into the blood capillaries surrounding the renal tubule. It occurs through osmosis, diffusion and active transport.

(vii) **Differentiate between glomerulus and Bowman's capsule.**

Ans Glomerulus is a network of capillaries while the Bowman's capsule is a cup-shaped structure that encloses the glomerulus.

(viii) **Draw a labelled diagram of the urinary system of human.**

Ans

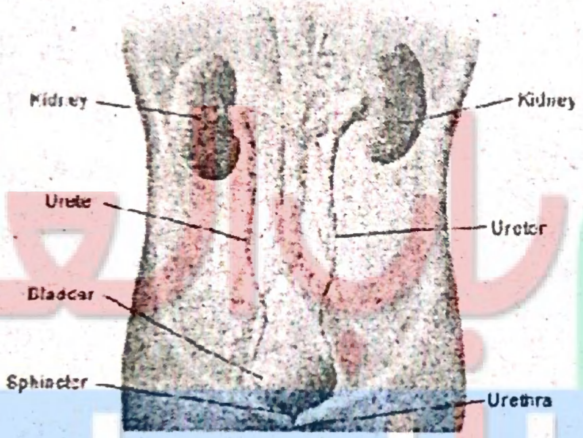

Fig. The urinary system of humans.

(ix) **Name the types of coordination in living organisms.**

Ans Nervous coordination and chemical coordination.

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3. Write short answers to any Five (5) questions: 10

(i) **Name some important endocrine glands in human.**

Ans The important endocrine glands in human are pituitary glands, thyroid glands, parathyroid glands, adrenal glands, pancreas and gonads.

(ii) **Differentiate between immoveable and moveable joints.**

Ans The joints which allow no movement are called as immoveable joints *e.g.*, the joints between the skull bones. While the joints which allow different types of movements are called as moveable joints *e.g.*, shoulder joints, hip joints, etc.

(iii) What are the main causes of osteoporosis?

Ans The main causes of osteoporosis are malnutrition, lack of physical activities or deficiency of estrogen hormone.

(iv) Why is reproduction necessary?

Ans Reproduction is necessary for the continuation of species. It ensures that the genetic material of one generation is transmitted to the next. Each generation produces more offsprings for the next generation.

(v) How does budding occur in corals?

Ans In corals, the buds do not detach from the parent body. The corals form big colonies because the buds grow into new organisms by remaining attached to the parent body.

(vi) What is meant by AIDS?

Ans AIDS stands for acquired immuno deficiency syndrome. It is a sexually transmitted disease caused by HIV virus.

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(vii) Define homologous chromosomes.

Ans The two chromosomes of a pair are called as homologous chromosomes *e.g.*, in human, there are 23 pairs of homologous chromosomes.

(viii) Define fertilization.

Ans The fusion of male and female gametes to form zygote is called as fertilization.

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4. Write short answers to any Five (5) questions: 10

(i) What is pyramid of numbers?

Ans It is the graphic representation of the number of individuals per unit area at various trophic levels. In this type of pyramid, usually the producers are in large number.

(ii) Name two carnivorous plants.

Ans Pitcher plant, sundew.

(iii) What are epiphytes?

Ans The epiphytes are small plants which grow on the parts of larger plants for space only. They absorb water and minerals from the atmosphere and prepare their own food. The larger plants are neither benefited nor harmed in any way.

(iv) Name two endoparasites.

Ans Entamoeba, plasmodium.

(v) What are important effects of global warming?

Ans Due to global warming, the polar ice-caps and glaciers melt faster. Moreover, the sea water expands causing sea levels to rise. Due to melting of glaciers, rivers overflow and cause floods.

(vi) Name two dairy products produced by fermentation.

Ans Cheese and yogurt are the important dairy products produced by fermentation.

(vii) Name two blood diseases which are cured by genetic engineering.

Ans Thalassaemia, sickle cell anaemia.

(viii) Why is Joseph Lister famous for?

Ans Joseph Lister promoted the idea of sterile surgery first time. He introduced carbolic acid to sterilize surgical instruments to clear wounds.

Part-II

NOTE: Attempt any Three (3) questions.

5.(a) Explain what can happen if there is no coordination in the activities of the organisms. 4

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Ans The tissues and organs of the body of multicellular organisms do not work independently. But they rather work together to perform various tasks according to the needs of the body. This means that these activities are coordinated. Thus, the coordination enables the organism to respond to the happenings in the world around it. For example, in coordination, the muscles of the body work together during movement. When a boy runs to catch a ball, he uses hundreds of muscles to move his arms, legs and back. His nervous system uses information from his sense organs and coordinates these muscles. Due to this coordination, the muscles contract in correct sequence, power and length of time. However, it is not all. Various other kinds of coordinations are also involved in it. For example, breathing and heartbeat rates are increased. Blood pressure is adjusted and extra heat is removed fast from the body. If these activities may not occur, the body cannot work as a single unit.

(b) Write notes on: 3

(i) Kidney failure **(ii) Xerophytes**

Ans (i) **Kidney failure** means a complete or partial failure of kidneys to function. The main causes of kidney failure are diabetes mellitus and hypertension. In certain cases, overdoses of drugs and sudden interruption in the blood supply to the kidneys cause kidney failure. The main symptoms of kidney failure are the high level of urea and other wastes in the blood. These cause vomiting, nausea, weight loss, frequent urination and blood in urine. Excess fluids in the body may also cause the swelling of legs, feet and face and shortness of breath. The kidney failure is treated with dialysis and kidney transplant.

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(ii) **Xerophytes** are the plants which live in dry habitat. These have thick cuticle on the surface of the leaves which reduces the water loss. Moreover, these plants have less number of stomata. Therefore, the loss of water due to transpiration is reduced. These are rooted plants *e.g.*, pinus. Some xerophytes store a large quantity of water in their parenchymatous cells *e.g.*, cactus.

6.(a) Describe negative feedback with reference to insulin and glucagon. 3

Ans In negative feedback, the output of a process decreases or inhibits the process. This mechanism works to return a condition towards its normal value. For example, when the blood glucose concentration rises, pancreas secretes insulin. It decreases the blood glucose concentration. Decline in the blood glucose concentration to a normal set point inhibits the secretion of insulin. Similarly, when blood glucose concentration drops below normal, the pancreas secretes glucagon. It raises the blood glucose concentration. In this case, rise in the blood glucose concentration to a normal set point inhibits the secretion of glucagon. In other words, the blood glucose concentration controls the process *i.e.*, the secretion of insulin and glucagon.

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(b) Write notes: 4

(i) Appendicular skeleton

(ii) Discontinuous variations

Ans (i) The **appendicular skeleton** is composed of 126 bones. The pectoral girdle is made of 4 bones. The arms have 6 bones while both the hands have 56 bones. Pelvic girdle has 2 and the legs have 8 bones. While both the feet have 56 bones.

(ii) The discontinuous variations show distinct phenotypes. The phenotype of such variations cannot be measured. Blood groups are a good example of such variations. These variations are controlled by the alleles of a single gene pair. The environment has little effect on such variations.

7.(a) Write the structure of flower. **5**

Ans Flower is a reproductive structure found in the flowering plants. The important parts of a typical flower are as follows:

(i) **Calyx:**
It is the outermost whorl of the flower. The leaflets of calyx are green in colour and protect the inner parts of the flower.

(ii) **Corolla:**
It consists of brightly coloured petals. These serve to attract the insects which are the agents of pollination.

(iii) **Androecium:**
These are the male reproductive parts of the flower. The units of androecium are called as stamens. Each stamen consists of a filament and anther. The anther has two pollen sacs consisting of pollen grains produced through meiosis. Each pollen grain (microspore) germinates into male gametophyte generation. During this, the nucleus of the microspore undergoes mitosis and produces two nuclei *i.e.,* a tube nucleus and a generative nucleus. The generative nucleus again undergoes mitosis and produces two sperms. Thus a germinated microspore has a tube nucleus and two sperms. All these structures are the male gametophyte generation of the plant.

(iv) **Gynoecium:**
It is the female reproductive part of the flower. Its units are called as carpels or pistils. Each carpel has

ovary (the basal part), style (middle part) and the stigma (the upper part). Within the ovary, there are one to many ovules. Inside each ovule, one haploid microspore is produced through meiosis. The microspore germinates into the female gametophyte generation. During this, the macrospore undergoes mitosis and produces an egg cell and some associated structures like fusion nucleus. The egg cell and associated structures are the female gametophyte of the plant.

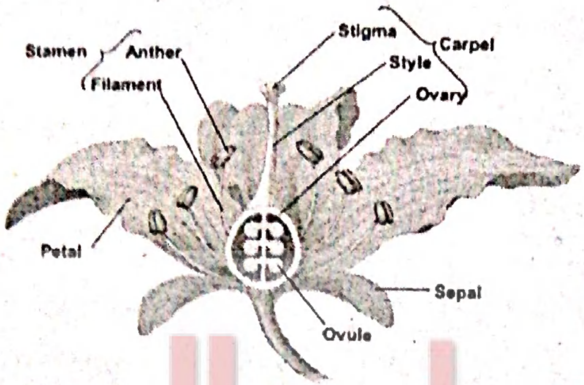

Fig. Structure of a flower.

(b) Describe the major groups of antibiotics. 3

Ans The major groups of antibiotics are as follows:

(i) Cephalosporins:

These interfere with the synthesis of bacterial cell wall. Therefore, these are called as bactericidal. These are used to treat pneumonia, sore throat, bronchitis, etc.

(ii) Tetracycline:

These are broad spectrum bacteriostatics and inhibit bacterial protein synthesis. These are used to treat the infections of respiratory tract, urinary tract, intestine, etc. These are broad-spectrum bacteriostatic antibiotics. These are not used in children under the age of eight years.

***(iii)* Sulpha drugs-sulfonamides:**

These are synthetic antibiotics that contain sulfonamide group. These are used to treat pneumonia and urinary tract infections.

8.(a) Describe the role of biotechnology in the field of food and agriculture. **4**

Ans Biotechnology has played a significant role in the fields of food and agriculture. With the help of microorganisms, fermented food like pickle, curd has been prepared. In the same way, malted food like powdered milk and certain dairy items are being produced by the use of this technology. Moreover, wine and beer are also being produced by the use of biotechnology. In agriculture, such transgenic plants (plants having a foreign gene) have been produced which give more yield and are resistant to pesticides and herbicides. Similarly, transgenic animals like cows, goats give more milk and meat. The nutritious value of milk and meat has also been increased by the use of biotechnology. In addition, different types of drugs are obtained from the urine, milk, etc. of transgenic animals such as rats, cows, goats, etc.

(b) What is fermenter? Describe two types of fermentations occurring in the fermenters. **4**

Ans Fermenter is a device which provides an environment to the microorganisms in a biomass to react with a substrate to form a product.

Types of fermentation:

There are two types of fermentation occurring in a fermenter:

(i) Batch fermentation:

In this type of fermentation, the fermenter is filled with raw material and sterilizes it with steam. Suitable temperature and pH are adjusted for fermentation. A pure culture of microorganisms is also added into the fermenter. Fermentation is started and the material of the fermenter is taken out after a suitable time. In this way, this process is repeated after intervals within the fermenter

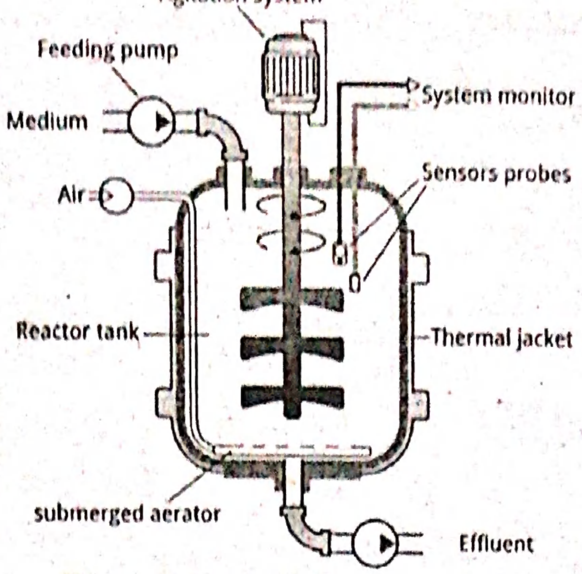

Fig. A batch fermenter.

(ii) Continuous fermentation:

In this type of fermentation, the substrate is added into the fermenter at a fixed rate. The microorganisms within the fermenter remain at the stage of growth. The products of fermentation are continuously taken out.

9.(a) Describe the importance of decomposers in an ecosystem. **3**

Ans Decomposers include bacteria and fungi. These decompose the dead organic matter of plants and animals into simple substances with the help of enzymes. The decomposers absorb these simple substances. While some of these simple substances become the part of the environment. Some of these simple substances are also absorbed in the soil to increase its fertility. Decomposers play an important role in reducing the environmental pollution.

(b) Describe the drugs obtained from plants and fungi. **4**

Ans Several drugs are obtained from plants and fungi. These include antibiotics, cardiotonics and analgesic. For example, 'digital' is a cardiotonic. It is made from the leaves of foxglove plant. It is used for heart stimulation. Similarly, morphine is obtained from the juice of opium poppy plant. It is used for relieving pain. Moreover, the antibiotic penicillin comes from a fungus.

Part-III

(Practical Part)

NOTE: Attempt any Two (2) questions.

(A-i) Give two examples of discontinuous variations in human. **3**

Ans Blood groups, tongue rolling.

(A-ii) You have observed bull eye. In which part of the eye, sensory cells are found? **2**

Ans Sensory cells are found in the retina of the eye.

(B-i) Make a list of the path of light in human eye. **3**

Ans When the light strikes the eye, it passes through the cornea. Then the light is passed through aqueous humour. From the aqueous humour, the light enters into the pupil and reaches to the lens. The lens focuses the light on the retina.

Eye→cornea→aqueous humour→pupil→lens→retina

(B-ii) Which are the important sources of calcium in food? **2**

Ans The important sources of calcium in food are milk, egg yolk, cheese, beans, nuts, etc.

(C-i) You have investigated the nature of bone. Write the required material for this experiment. **3**

Ans Three pieces of sheep's bone (each 2 cm in length), NaOH, dilute HCl, forceps, beakers, water, etc.

(C-ii) What is the role of yeast in our daily life? **2**

Ans Yeast plays an important role in fermentation of various products used in daily life. For example, in dairy industry, yeast plays an important role like making bread, cheese, etc.